REMARKS

The Examiner's Action mailed on April 11, 2007 has been received and its contents carefully considered.

In this Amendment, Applicants have amended claims 2 and 8. New dependent claims 15 and16 have been added to the application. Claims 2 and 8 are the independent claims. Claims 2-16 are pending in the application. For at least the following reasons, it is submitted that this application is in condition for allowance.

The Examiner has also rejected claims 2-14 under 35 U.S.C. 103(a) as being unpatentable over the combination of each of *Lloyd* (US 4,209,585) and *Fleming* (US 2002/0055134A1) in view of *Levenberg* (US 2005/0031598). Claims 2 and 8 have been amended. It is submitted that these amended claims are *prima facie* patentably distinguishable over these references for at least the following reasons.

It is well-settled law that in order to properly support an obviousness rejection under 35 U.S.C. §103, there must have been some teaching in the prior art to suggest to one skilled in the art that the claimed invention would have been obvious. W. L. Gore & Associates, Inc. v. Garlock Thomas, Inc., 721 F.2d 1540, 1551 (Fed. Cir. 1983).

Amended independent claim 2 is directed to a method of water analysis in a semiconductor manufacturing process for detecting a presence of microorganisms in a water sample, comprising: providing a membrane as a filter; filtering out the microorganisms in the water sample in the semiconductor manufacturing process, using

the membrane; growing the microorganisms on the membrane with a nutrient solution; staining the microorganisms on the membrane with potassium permanganate ($KMnO_4$); rinsing the membrane with purified deionized water; and performing a colony count for microorganisms on the membrane after rinsing the membrane with purified deionized water.

Amended independent claim 8 is directed to a method of water analysis in a semiconductor manufacturing process for separately detecting a presence of microorganisms in a plurality of water samples, comprising the steps of: providing a plurality of membrane as filters; filtering out the microorganisms in each of the water samples in the semiconductor manufacturing process, using a corresponding one of the membranes, separately; growing the microorganisms on different membranes with a nutrient solution for different times; staining the microorganisms on each of the membranes with potassium permanganate ($KMnO_4$); rinsing each of the membranes with purified deionized water; and performing a colony count for microorganisms on each of the membranes after rinsing each of the membranes with purified deionized water.

The Examiner states that *Lloyd* and *Fleming* don't specify the stain is potassium permanganate, but *Levenberg* teaches staining cells with potassium permanganate. Accordingly, the Examiner alleges that it would be obvious to stain the cells of the primary references with potassium permanganate as taught by *Levenberg*, and further states that no unexpected results are taught by selection of potassium permanganate. However, it is submitted that it would not be at all obvious to make such a combination.

Lloyd (US 4,209,585) discloses a method of automatically sampling for microorganisms in a liquid product flowing in a liquid product processing line. The method is used for detecting the liquid product processing line, for example any bottled product such as a consumable product or drug. However, the claimed invention is restricted in the semiconductor manufacturing process for detecting the presence of microorganisms in a water sample. It is often necessary to provide water free of impurities or to determine the amount of impurities in water used in the semiconductor manufacturing process. Successful water analysis helps in monitoring and controlling the quality of deionized water used in cleaning the wafer so that the accuracy and precision of the semiconductor products can be well controlled. For example, if deionized water used in semiconductor manufacturing process is not clean, microorganisms could over-grow on the photo-resist (PR) coated on the wafer and the colonies of microorganisms could change the PR pattern. After proceeding with the exposing and developing procedures, the semiconductor patterns on the wafer would not be preciously identical to the pre-determined patterns. The patterns lose their accuracy and precision and have a bad influence on the functions and properties of the semiconductor devices. Therefore, the claimed method specifically used in the semiconductor manufacturing process is able to maintain the accuracy and precision of semiconductor patterns as well as the device functions.

Moreover, *Lloyd* does not disclose or suggest the step of rinsing the membrane before performing the colony count, as recited by claims 2 and 8. According to the claimed invention, after staining and before doing the colony count, the step of rinsing

the membrane with purified deionized water is performed to wash out the impurities (including dye, dust or the likes) other than the colonies of microorganisms, so that unpredictable changes are unlikely to show on the microorganisms, and the colonies of microorganisms are well presented. It is much easier to count the colonies of microorganisms having a good quality.

Based on the above, *Lloyd* nowhere shows or suggests the step of "filtering out the microorganisms in each of the water samples in the semiconductor manufacturing process", and in particular, the step of "performing a colony count for microorganisms on each of the membranes **after** rinsing the membrane with purified deionized water", as recited by claims 2 and 8. Accordingly, the unexpected results, including forming accurate and precise semiconductor patterns and presenting colonies with an easy-to-count quality, taught by the claimed invention, are not taught by the disclosure of *Lloyd* or by just simply by selecting potassium permanganate as the dye.

Fleming (US 2002/0055134A1) discloses a method and apparatus for viable and nonviable prokaryotic and eukaryotic cell quantitation. The reference fails to disclose or suggest the microorganisms are filtered out in the water sample in the semiconductor manufacturing process. Also, the reference neither discloses nor suggests that the microorganisms are stained with potassium permanganate ($KMnO_4$), nor does this reference disclose or suggest that the microorganisms are grown on the membrane with a nutrient solution. Futhermore, the reference nowhere shows or suggests the step of performing a colony count for microorganisms on the membranes **after** rinsing the membrane with purified deionized water.

Levenberg (US 2005/0031598) discloses an engineering 3D tissue structure using differentiating embryonic stem cells. However, the reference does not disclose or suggest any step recited in the claimed invention. The potassium permanganate of *Levenberg* is used to stain the RA-conditioned constructs in vivo and in vitro, and the stained results confirmed that RA-conditioned constructs in vivo exhibited larger and better organized neural structures than those seen in vitro, by showing ductular structures lined by tall columnar epithelium invested with long cilia resembling ependymal cells and rosettes with abundant melanin granules (para. [108]). *Levenberg* nowhere shows or suggests a method of water analysis in a semiconductor manufacturing process for detecting a presence of microorganisms in a water sample.

Contrary to the detecting of microorganisms in a water sample in a semiconductor manufacturing process, the cited references, *Fleming* and *Levenberg*, are related to the fields of prokaryotic and eukaryotic cells, and embryonic stem cell differentiation, respectively. Those cited references are thus from non-analogous arts. A person skilled in the semiconductor field, seeking to sufficiently analyze water purity in the semiconductor manufacturing process, would not be reasonably expected to look to fields of prokaryotic and eukaryotic cells, and embryonic stem cell differentiation. Thus, the non-analogous arts, *Fleming* and *Levenberg*, are insufficient to be combined as references to present a *prima facie* case of obviousness (*In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992)*).

Furthermore, the weight of the claimed method must be considered in its entirety, rather than in a piece-meal manner. The three cited references (including *Lloyd*,

Fleming, and *Levenberg*) all fail to disclose or suggest their applicability to the semiconductor industry. Also, the unexpected results, including forming accurate and precise semiconductor patterns and presenting colonies with an easy-to-count quality, taught by the claimed invention, are not taught by just simply selecting potassium permanganate. Besides, the references (*Fleming* and *Levenberg*) from non-analogues arts neither disclose nor suggest any step for detecting the water purity in the semiconductor manufacturing process, as recited in Applicant's claimed invention. Accordingly, all of the cited references, including the primary reference (*Lloyd*) and non-analogues references (*Fleming* and *Levenberg*), do not teach or suggest to the persons of ordinary skill in the semiconductor art how to form accurate and precise semiconductor patterns and presenting colonies with an easy-to-count quality, as disclosed by Applicant's claimed invention. The reference teachings could not be combined or modified to produce the claimed invention (*In re linter*, 458 F. 2d 1013, 1016, 173 USPQ 560,562 (CCPA 1972); *In re Kotzab*, 217 F, 3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000)). Thus, there is nothing in any of the cited references as a whole to suggest the desirability of the combination, and there is no suggestion to combine these references to arrive at the claimed invention. It is thus not obvious to make such a combination.

It is therefore submitted that the amended independent claims 2 and 8 *prima facie* patentably distinguish over the prior arts, and claims 3-7, 15 and 9-14 and 16 are allowable for at least the reason that they depend from claims 2 and 8, so that this

application is deemed clearly to be in condition for allowance. Allowance of the application and the passing of this case to issue are therefore respectfully requested.

If the Examiner believes that a conference would be of value in expediting the prosecution of this application, the Examiner is hereby invited to telephone the undersigned counsel to arrange for such a conference.

Should any fee be required, the Director is hereby authorized to charge the fee to our Deposit Account No. 18-0002, and is requested to please advise us accordingly.

Respectfully submitted,

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Date

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